

# Notice of Allowability

Application No.

10/717,161

Examiner

Henry S. Hu

Applicant(s)

KONABE, KAZUO

Art Unit

1713

## -- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to Amendment of May 26, 2006.
2. ☒ The allowed claim(s) is/are 1-10.
3. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
  - a) ☐ All b) ☐ Some\* c) ☐ None of the:
    1. ☐ Certified copies of the priority documents have been received.
    2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
    3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

\* Certified copies not received: \_\_\_\_\_.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

**THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.**

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
  5. ☐ CORRECTED DRAWINGS ( as "replacement sheets") must be submitted.
    - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review ( PTO-948) attached
      - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date \_\_\_\_\_.
    - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date \_\_\_\_\_.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

### Attachment(s)

1. ☒ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3. ☐ Information Disclosure Statements (PTO-1449 or PTO/SB/08), Paper No./Mail Date \_\_\_\_\_
4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
5. ☐ Notice of Informal Patent Application (PTO-152)
6. ☐ Interview Summary (PTO-413), Paper No./Mail Date \_\_\_\_\_
7. ☒ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other \_\_\_\_\_

### EXAMINER'S AMENDMENT

1. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with **Edwin Tocker (registration # 20,341, tel. 302 892-7903) on July 10, 2006** to amend Claim 10 as following:

**Claim 10** at line 1 please replace recitation of "claim 1" with recitation of "claim 6"

### DETAILED ACTION

2. Applicants' **Amendment** in response to non-final office action was filed on May 26, 2006. **Claims 1-2 and 6-7 were amended; no claim was cancelled, while new Claim 10 was added.** To be more specific, both parent **Claims 1 and 6** were amended in **two ways** as: (A) to recite using tetrafluoroethylene-based polymer in fibrillatable form and then (B) using extrusion lubricant coagent. Dependent **Claims 2 and 7** were amended to use proper recitation of **perfluorobutyl ethylene** monomer for clarification in responding to claim objection raised by

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Examiner; new Claim 10 relates to an electrode by the process of parent Claim 6 (not Claim 1).

The above Examiner's amendment is to correct improper claim dependency of Claim 10.

The Applicants have corrected the same errors on the use of "perfluorobutyl ethylene" on pages 3 and 5 of specification. The examiner thereby withdraws specification objection and claim objection in the previous Office Action dated December 1, 2005. **Claims 1-10 are now pending** with two independent claims (Claims 1 and 6). An action follows.

3. Claim rejections under Non-Final Office Action filed on December 1, 2005 are now removed for the reasons given in paragraphs 4-11 thereafter.

***Allowable Subject Matter***

4. Claims 1-10 are allowed.

5. The following is an examiner's statement of reasons for allowance: The above Claims 1-10 are allowed over the closest references:

6. *The limitation of parent Claim 1 relates to a binder for electrode materials which comprises "fibrillatable" tetrafluoroethylene-based polymer fine particles having an average particle size of not more than about 0.20  $\mu\text{m}$  and having a standard specific gravity of not more than about 2.20, wherein a mixture prepared from said fine particles with about 17% by weight*

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*of the total mixture of an “extrusion lubricant coagent”, when subjected to the measurement of an extrusion pressure by a rheometer, exhibits under two conditions as: (A) a draw ratio of 100 to 1 and an extrusion speed of 18 +/- 2 mm/min, and (B) an extrusion pressure of not less than about 220 kg/cm<sup>2</sup>.*

*Other parent **Claim 6** relates to a process of making a binder of **Claim 1**. See other limitations of dependent **Claims 2-5 and 7-10**.*

7. In view of the Applicants' Amendment, parent **Claim 1** (product) and parent **Claim 6** (process of making) of present invention relate to a binder to be very useful for making electrode materials. The binder comprises two major components as: (A) “fibrillatable” TFE-based polymer fine particles having an average particle size of not more than about 0.20  $\mu\text{m}$  and having a standard specific gravity of not more than about 2.20, and (B) 17% by weight of the total mixture of an “extrusion lubricant coagent”.

Both parent **Claims 1 and 6** have been amended in **two ways** as a combination including: (A) to recite using tetrafluoroethylene-based polymer in fibrillatable form and then (B) using extrusion lubricant coagent. In a close examination on such a combination of two specific limitations, 103 rejection by Tamura/Finlay cannot stand as following:

8. With respect to one requirement on using fibril-like PTFE, even primary reference **Tamura** in each of US and JP patents may have disclosed a process of making a positive mass composition for a non-aqueous electrolyte cell, the composition is still not the same as claimed

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composition since it comprises (A) manganese dioxide powder, (B) carbon powder and (C) **a PTFE powder**. The particles of PTFE powder are small enough to be in the sizes up to 30  $\mu\text{m}$  so that it can be uniformly mixed with the manganese dioxide powder and carbon powder, uniform dielectric resistance on the positive mass can be thereby obtained. However, **PTFE in fibrillatable form is certainly quite different from PTFE in powdery form** as well known in the art. Such a difference has been shown in many performances in the art.

With respect to the other requirement on using “extrusion lubricant coagent”, secondary reference **Finlay** may have disclosed using a mixture of **unsaturated coagent** can be mixed with fluorinated polymer composition when other additives such as metal oxide and carbon black powder being used so as to effectively form into shaped structures by extrusion or molding. However, **Finlay does not disclose or suggest using extrusion coagent as a lubricant** according to Applicants’ statement presented on page **8** top of Remarks.

9. Additionally, the present invention has shown **unexpected results** in examples along with some comparative examples for making such a binder for making electrode with such a combination on fibrillatable PTFE polymer and extrusion lubrication coagent (see pages 8-11 for **example 1, comparative examples 1-3** along with its **Table I**; particularly see detailed summary presented by Applicants on pages **6-7** of Remarks). Therefore, all the above-mentioned references, in combination or alone, does not teach or fairly suggest the limitations of present invention.

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Newly added dependent Claim 10 is only related to an electrode article by the **process** of parent Claim 6. In summary, Tamura/Finlay's composition is quite different from that of present invention. After more search, Examiner has found that **GB Patent No. 2,408,959 A to Konabe and JP Patent No. 2004-31179 to Konabe** are both equivalent to this Application.

No X reference is cited at all in search report.

10. After further examination and search, the examiner found the following prior art did not teach the claimed limitation:

**US Patent No. 4,722,773 to Plowman et al.** only discloses the preparation of a binder for electrode materials by combining PTFE or its PTFE copolymer with carbon black (column 5, line 17-25; column 6, line 13-22). However, **extrusion lubrication coagent and fibril-like PTFE are not disclosed or suggested as a combination at all for use in extrusion or molding**. Therefore, Plowman fails to teach or fairly suggest the limitation of present invention.

**US Patent No. 4,211,868 to Erdman** only discloses the preparation of making a fluoroelastomer gelling agent such as **HFTAIC** to be useful as **coagent** for gelling various types of fluoroelastomer (column 4, line 5-65; column 3, line 59-67; column 1, line 10-28). Fluoroelastomer blends made with this gelling agent exhibit improved extrusion and milling (column 1, line 16-28). Such a gelling agent is not disclosed or suggested using it to make a binder composition for use in extrusion or molding electrode material. Additionally, **extrusion lubrication coagent and fibril-like PTFE are not disclosed or suggested as a combination at**

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**all for use in extrusion or molding.** Therefore, Erdman fails to teach or fairly suggest the limitation of present invention.

11. The key issues, regarding making a binder with such a combination of fibrillatable PTFE polymer and extrusion lubrication coagent for making electrode, cannot be overcome by any or the combination of the above references, therefore, the present invention is novel.

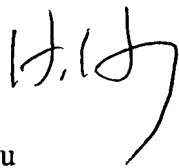
12. As of the date of this office action, the examiner has not located or identified any reference that can be used singularly or in combination with another reference including the above references to render the present invention anticipated or obvious to one of the ordinary skill in the art. Therefore, parent **Claim 1** (product) and parent **Claim 6** (process of making) are allowed for the reason listed above. Since the prior art of record fails to teach the present invention, the remaining pending dependent **Claims 2-5 and 7-10** are passed to issue.

13. Any inquiry concerning this communication or earlier communication from the examiner should be directed to **Dr. Henry S. Hu** whose telephone number is **(571) 272-1103**. The examiner can be reached on Monday through Friday from 9:00 AM –5:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Wu, can be reached on (571) 272-1114. The fax number for the organization where this application or proceeding is assigned is **(571) 273-8300** for all regular communications.

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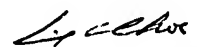
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Henry S. Hu

Patent Examiner, Art Unit 1713, USPTO

July 10, 2006



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PRIMARY EXAMINER